

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application, Claims 7, 9 and 10 are currently being prosecuted. The Examiner is respectfully requested to reconsider his rejections in view of the Amendments and Remarks as set forth hereinbelow.

REJECTION UNDER 35 U.S.C. § 102

Claims 1-3 have been canceled. Accordingly, the rejection of claims 1-3 under 35 U.S.C. § 103(a) as anticipated by Hirabayashi in view of Lungu is moot.

REJECTION UNDER 35 U.S.C. § 103(a)

Additionally, claims 4-6 have been canceled. Accordingly, the rejection of claims 4-6 under 35 U.S.C. § 103(a) as unpatentable over Hirabayashi in view of Lungu and Hitoo et al. is moot.

Claims 7-10 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Hirabayashi in view of Kurahashi et al. This rejection is respectfully traversed.

Amended independent claim 7 includes a combination of features and is directed to a method of driving an electromagnetic pump. The method includes conveying a fluid from a pump chamber formed inside a cylinder by housing a plunger including a permanent magnet inside the cylinder, passing a current through an aircore electromagnetic coil fitted around the cylinder, and switching a direction of the current, to reciprocally move the plunger in the axial direction inside the cylinder, and flowing a pulse current including a period where a current value is zero when a supplied current of the electromagnetic coil is inverted. Further, a minute current at least 30% of an inverted maximum current flows for a minute time period before the period where the current value is zero, when a polarity of the supplied current of the

electromagnetic coil is inverted. Independent claim 9 includes similar features in a varying scope. These features are supported at least by Fig. 10 and the corresponding description in the specification.

On the contrary, in Kurahashi et al., a break period of applying a voltage is set to restrain a conflict between the mechanical vibration and electrical vibration. In addition, in Fig. 10 of Kurahashi et al., a period where a supply current is zero appears every time a moving direction of a piston is switched, and a minute pulse voltage appears. However, the minute pulse voltage is not intentionally input. In Kurahashi et al., a "counter electromotive voltage" is generated by an induced voltage, which is induced by switching the energization of a coil. In Fig. 10 of Kurahashi et al., a minute pulse voltage wave form generated by inverting a polarity is included in an input voltage wave form, but no inverted minute pulse current is intentionally supplied to an input current wave form. This differs from the claimed invention in which the minute pulse current adjusted to the prescribed value of the inverted side and the break period where the current value is zero is intentionally generated. It is respectfully submitted neither Hirabayashi nor Kurahashi et al. teach or suggest these features.

Accordingly, it is respectfully submitted independent claims 7 and 9 and each of the claims depending therefrom are allowable.

CONCLUSION

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied upon by the Examiner, either alone or in combination.

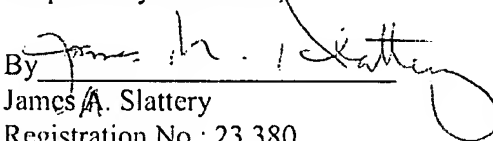
Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but to merely show the state of the art, no comment need be made with respect thereto.

If the Examiner believes for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone David A. Bilodeau at (703) 205-8072 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

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Respectfully submitted,

By 

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